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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NORIYA HAYASHI

Appeal 2009-006408
Application 09/664,332
Technology Center 1700

Decided: May 11, 2010

Before LINDA M. GAUDETTE, KAREN M. HASTINGS,
and JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1-3, 6-8, 10, 12, 22, 27, and 28 (Final Office Action ("Final"), mailed Jul. 7, 2005, 1), the only claims pending in the application. (*See* Appeal Brief ("App. Br."), filed Nov. 13, 2006, 5 and 12.) We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The Examiner maintains (Examiner's Answer ("Ans."), mailed Dec. 21, 2005, 2-8), and Appellant requests review of (App. Br. 12), the sole ground of rejection: claims 1-3, 6-8, 10, 12, 22, 27, and 28 under 35 U.S.C. § 103(a) as unpatentable over Hamazu (US 5,359,017, issued Oct. 25, 1994), Buchwalter (US 5,879,859, issued Mar. 9, 1999), Starkey (US 5,384,339, issued Jan. 24, 1995), and Green '592 (US 4,252,592, issued Feb. 24, 1981) in view of Green '938 (US 4,299,938, issued Nov. 10, 1981).

Appellant expressly states that the claims are argued as a group. (App. Br. 13.) Therefore, we decide the appeal as to all the appealed claims on the basis of independent claim 1.

ISSUES

The first issue raised in this Appeal is:

Did the Examiner err in finding that the applied prior art suggests a composition containing the claimed curing agent component and photopolymerization initiator component in the proportions claimed in the last two clauses of appealed claim 1?

Because we answer this question in the negative, as further explained below, we also consider as a second issue:

Did the Examiner err in determining that the evidence as a whole, taking into account Appellant's evidence of unexpected results, weighs in favor of obviousness?

We also answer this question in the negative. Our findings and analysis follow.

FINDINGS OF FACT ("FF")

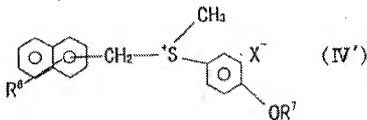
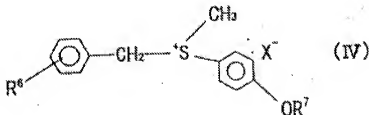
We adopt all of the Examiner's findings in the Final and the Answer as our own (Ans. 3-17; Final 2-5), but focus on the following findings in our decision:

1. Claim 1 reads as follows:

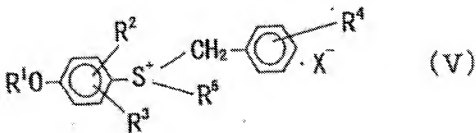
An energy-ray curing resin composition comprising a photopolymerizable resin component which can be cured by irradiation with an energy ray, a photopolymerization initiator component which makes it possible to cure by chain reaction said photopolymerizable resin component with irradiation of an energy ray, and a curing agent component capable of curing at least one of said photopolymerizable resin components without irradiation of an energy ray,

wherein said curing agent component comprises an acid anhydride or a derivative thereof,

said photopolymerization initiator component comprises a sulfonium salt, the sulfonium salt being a photo-thermopolymerization initiator which can initiate polymerization by both of light and heat, and being represented by the following general formula (IV), (IV'), or (V):



in Formula (IV) or (IV') described above, R^6 represents hydrogen, halogen, a nitro group or a methyl group; R^7 represent hydrogen, CH_3CO , or CH_3OCO ; and X^- represents SbF_6^- , PF_6^- , AsF_6^- or BF_4^- ;



in Formula (V) described above, R^1 represents hydrogen, a methyl group, an acetyl group, or a methoxycarbonyl group; R^2 and R^3 each independently represent hydrogen, halogen or an alkyl group of C_1 to C_4 ; R^4 represents hydrogen, halogen or a methoxy group; R^5 represents an alkyl group of C_1 to C_4 ; and x represents SbF_6^- , PF_6^- , AsF_6^- or BF_4^- , and

wherein said curing agent component is present with a proportion of 0.3 to 1.4 mol per mol of said photopolymerizable resin component which can react with said curing agent component,

wherein said photopolymerization initiator component is present with a proportion of 0.1 to 6.0 parts by weight per 100 parts by weight of the whole weight of the other components than the photopolymerization initiator component.

(App. Br., Claims Appendix.)

2. The Examiner finds that Hamazu discloses a radiation and heat curable molding or sealing composition comprising a photopolymerizable resin component, a photopolymerization initiator component embraced by formula (IV), and a curing agent which may be an acid anhydride as recited in appealed claim 1. (Ans. 3 (citing, e.g., Hamazu, col. 3, ll. 29-30 and col. 5, l. 14).) Hamazu discloses that the resin may be 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate (*see* Appealed claim 8). (Ans. 3 (citing Hamazu, Exs. 33-38).) The Examiner further finds

that Hamazu teaches the initiator is preferably present in an amount from .01 to 20 parts by weight, even more preferably 0.1 to 10 parts by weight, based on 100 parts of the resin. (Ans. 3 (citing Hamazu, col. 3, ll. 56-61).)

3. Appellant does not dispute these findings. (*See generally*, App. Br. 13-22; Reply Brief (“Rep. Br.”), filed Feb. 21, 2006, 2-10.)

4. The Examiner concedes that neither Hamazu nor the other applied references disclose Appellant’s claimed curing agent: photopolymerizable resin molar ratio of from 0.3:1 to 1.4:1. (Ans. 6.) However, the Examiner finds (Ans. 6), and Appellant concedes (App. Br. 21-22; Rep. Br. 5) that Buchwalter Example 1 discloses a composition containing an epoxy resin and acid anhydride curing agent as claimed in claim 1 in amounts which fall within the claimed range of 0.3 to 1.4 mol curing agent per mol resin component.

5. Starkey discloses a balancing compound comprising an epoxy resin, a photoinitiator, and an optional thermohardening catalyst (curing agent) which may be maleic anhydride (col. 20, ll. 10 and 38-39). According to Starkey, when a thermohardening catalyst (curing agent) is used, it is preferably present in an amount of from 0.01 to 10 parts by weight of the resin composition to provide sufficient strength. (Col. 21, ll. 12-23.)

6. The Examiner finds (Ans. 6), and Appellant concedes (*see* App. Br. para. bridging 18-19), that Starkey lists 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate and maleic anhydride as a suitable resin and catalyst (curing agent) for use in the inventive compound and that the molar ratio of these components falls within the claimed range of 0.3 to 1.4 where the anhydride is present in an amount of 10 parts by weight of the 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate.

7. Appellant relies on three declarations (“Decs. I-III”), executed by the inventor, Noriya Hayashi, in support of unexpected results. (App. Br., Evidence Appendix.) Appellant does not dispute that the experimental evidence in the declarations is limited to a single type of resin and curing agent, and to photoinitiators having Formula (IV) (Rep. Br. 7-8), and that testing was not conducted at or near the endpoints of the ranges recited in the last two paragraphs of claim 1 (Rep. Br. 9).

PRINCIPLES OF LAW

A prima facie case of obviousness exists where the prior art and claimed ranges overlap, as well as in those cases where the claimed range and the prior art range, though not overlapping, are sufficiently close that one skilled in the art would have expected them to have the same properties. *See In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003).

“[An] applicant’s showing of unexpected results must be commensurate in scope with the claimed range.” *Id.* at 1330.

The Board is entitled to weigh declarations expressing opinions as to fact and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004); *see also, In re Bulina*, 362 F.2d 555, 559 (CCPA 1966) (“[A]n affidavit by an applicant or co-applicant as to the advantages of his invention is less persuasive than one made by a disinterested person.”).

ANALYSIS

Appellant argues that the Examiner failed to establish a prima facie case of obviousness because the applied prior art fails to disclose or suggest

a composition which meets the limitations of the last two clauses of appealed claim 1. (App. Br. 15-22.) Appellant's arguments are not persuasive for the following reasons:

With respect to the last clause of claim 1, Appellant focuses on the Examiner's reference to Buchwalter, column 7, lines 1-3. (App. Br. 22 (citing Ans. 3).) However, Appellant has not attempted to refute the Examiner's finding that Hamazu discloses all of the limitations of claim 1, including the last clause (FF 2), with the exception of Appellant's claimed curing agent:photopolymerizable resin molar ratio of from 0.3:1 to 1.4:1 recited in the second to last claim 1 clause (FFs 3 & 4).

With respect to the second to last clause of claim 1, we find that the Examiner provided a reasonable basis for concluding that it would have been obvious to have used the anhydride curing agent of Hamazu in the amount claimed, namely, Starkey's explicit disclosure of the desirable properties achieved by using a curing agent in an amount of from 0.01 to 10 parts by weight of the resin (FF 5), which range has been demonstrated by the Examiner to overlap Appellant's claimed range (FF 6).

Appellant also relies on evidence of unexpected results to establish non-obviousness. (App. Br. 22-26.) Taking into account this evidence, along with all of the other arguments and evidence in the record before us, we find that a preponderance of the evidence favors the Examiner's conclusion of obviousness. Appellant's experimental evidence is not commensurate in scope with the claimed invention and, therefore, fails to establish criticality in the ranges recited in the last two clauses of claim 1. (Ans. 13-17; FF 7.) Further, we decline to give substantial weight to the

inventor's unsupported testimony as to the unexpected chain-curing effect achieved by the claimed invention. (*See* Rep. Br. 9 (discussing Decl. III).)

CONCLUSION

Appellant has not identified error in the Examiner's obviousness determination. The decision of the Examiner rejecting claims 1-3, 6-8, 10, 12, 22, 27, and 28 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED

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